Back to Table of Contents

Chapter 2.0 Description of Proposed Action and Alternatives

2.1 Introduction

This chapter describes the Proposed Action, three other action alternatives, and the No Action Alternative for the Toquop Land Disposal Amendment to the Caliente MFP and Toquop Energy Project. They are analyzed in detail in *Chapter 4, Environmental Consequences*, of this document and include the following:

- **Proposed Action.** Water-cooled power plant ROW, western utility alignment ROW, wellfield ROW, and access road ROW, southern power plant site ROW, Proposed Toquop Land Disposal Amendment to the Caliente MFP, and/or Toquop/Pah Rah land exchange (southern parcel).

- **Alternative 1.** Water-cooled power plant ROW, eastern utility alignment ROW, southern power plant site ROW, wellfield ROW, and access road ROW, Proposed Toquop Land Disposal Amendment to the Caliente MFP, Toquop land disposal (southern parcel) through sale or exchange.

- **Alternative 2.** Water-cooled power plant ROW, eastern utility alignment ROW, northern power plant site ROW, wellfield ROW, and access road ROW, Proposed Toquop Land Disposal Amendment to the Caliente MFP, Toquop land disposal (northern parcel) through sale or exchange.

- **Alternative 3.** Air-cooled power plant ROW, western utility alignment ROW, southern power plant site ROW, wellfield ROW, and access road ROW, Proposed Toquop Land Disposal Amendment to the Caliente MFP, Toquop land disposal (southern parcel) through sale or exchange.

- **No Action Alternative**

This chapter also describes alternative fuels, plant locations, and access roads that were considered during project formulation, but eliminated from detailed analysis.

The Proposed Action and each action alternative include the following project actions and features:

- Issue ROWs for Toquop Energy Project construction and operation.

- Construct, operate, and maintain a 1,100-MW (maximum) natural gas-fired electric power generating plant with an expected life of 42 years.

- Develop a wellfield in the Tule Desert to meet the process water needs of the power plant.

- Develop the linear infrastructure necessary to connect the power plant to the new water source, to existing natural gas and electric transmission lines serving the region, and to site access facilities.

The Proposed Action and Alternative 1 differ primarily in the location of the utility alignment (western vs. eastern). The Proposed Action and Alternative 2 differ primarily in the location of the power plant site (southern vs. northern) and, therefore, the parcel of BLM-managed public land to be exchanged or sold. The Proposed Action and Alternative 3 differ primarily in the method of cooling for the power plant. The power plant in the Proposed

Action would be water-cooled, and the power plant in Alternative 3 would be air-cooled. Maps 2-1, 2-2, and 2-3 show the locations of prominent features associated with the Proposed Action and Alternative 3, Alternative 1, and Alternative 2, respectively. As noted in Chapter 1, an option to the Proposed Action, Alternative 1, Alternative 2, and Alternative 3 as described here, is for the BLM to issue ROWs for all project features rather than proceed with this *Proposed Toquop Land Disposal Amendment to the Caliente MFP*. This issuance of ROWs is addressed in *Chapter 4, Environmental Consequences*.

As required for the issuance of ROWs, a Plan of Development (POD) would be finalized for the alternative selected for implementation. The POD will detail the methods and procedures to be used in the construction of the power plant, access road, and ancillary facilities. The POD will incorporate site-specific stipulations, terms, and conditions in order to satisfy all project-related construction requirements, as well as operational, maintenance, and restoration requirements, associated with lands administered by the Ely and Las Vegas Field Offices of the BLM where project features would be located.

The No Action Alternative represents the status quo—not approving or implementing the Proposed Action or any of the action alternatives. Analysis of the No Action Alternative is required by NEPA guidelines.

The Proposed Action, Alternative 1, and Alternative 2 were developed following public information meetings in Caliente and Mesquite, Nevada, and a scoping meeting in Las Vegas, Nevada, during July and August 2001. Comments received during those meetings and during the public scoping comment periods for the *Proposed Toquop Land Disposal Amendment to the Caliente MFP* were considered in formulating the Proposed Action and Alternatives 1 and 2. In addition, meetings were held with the U.S. Fish and Wildlife Service (FWS), local and regional staff of the BLM, and technical staff of the project proponents—Toquop Energy and NLRC—to aid in formulating the Proposed Action and Alternatives 1 and 2.

Based on these public comments and meeting discussions, the BLM decided to combine the Toquop Energy Project EIS with a related Environmental Assessment (EA) that BLM's Carson City Field Office had been preparing for the proposed Pah Rah/Toquop Land Exchange. That EA had been evaluating the exchange of approximately 640 acres of private land owned by the NLRC in the Pah Rah Range in Washoe County for a similarly valued, BLM-managed parcel of public land near the Toquop Wash in Lincoln County. Public scoping meetings on the proposed land exchange were held in Mesquite and Reno, Nevada, during July 2001. This proposed land exchange is now being evaluated as part of the Proposed Action in this *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*.

A different land disposal would occur under Alternative 2. Under this alternative, a parcel of BLM-managed public land approximately 12 miles north-northwest of the Toquop Wash plant site would be made available for disposal. This alternative site would be adjacent to and contiguous with the proposed wellfield in the Tule Desert. That wellfield is necessary for the Proposed Action and all action alternatives.

Map 2-1 11x17 color (front)

Map 2-1 11x17 color (back)

Map 2-2 11x17 color (front)

Map 2-2 11x17 color (back)

Map 2-3 11x17 color (front)

Map 2-3 11x17 color (back)

A proposed land disposal is part of the Proposed Action and action alternatives being addressed in this *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*. To proceed with the land exchange or sale, the public land to be disposed of must be identified in the Caliente MFP as being suitable for disposal. It has been determined that an environmental analysis is needed in the Caliente MFP for the 640 acres of public land that have been identified for disposal under the Proposed Action or action alternatives. Therefore, this document contains a focused *Proposed Toquop Land Disposal Amendment to the Caliente MFP* that addresses the proposed land disposal. The Pah Rah section of land to be acquired already meets the criteria for land acquisition in the Lahonton RMP, which is contained within the Consolidated RMP developed and administered by the BLM's Carson City Field Office. Therefore, no amendments to those RMPs are needed. If a land exchange could not be completed, the project might optionally proceed by building the power plant on public land with the issuance of appropriate ROWs from the BLM, and no amendment required for the Caliente MFP.

Alternative 3 (air-cooled power plant) was added in response to comments received on the DEIS and is evaluated in this *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*.

2.2 Proposed Action

2.2.1 Description of BLM Actions

BLM actions that could occur under the Proposed Action include issuing ROWs necessary for project construction and operation, proceeding with this *Proposed Toquop Land Disposal Amendment to the Caliente MFP*, and completing the Pah Rah/Toquop land exchange. These actions are briefly described in the following text.

2.2.1.1 ROWs

In lieu of or in advance of the land disposal for the Toquop Parcel, the BLM could issue ROWs necessary for the construction and operation of the Toquop Energy Project and related facilities. ROWs would be needed to construct and operate the water-cooled power plant prior to or in lieu of formal execution of the Pah Rah/Toquop land exchange; drill deep ground water wells in the Tule Desert to provide water for the power plant; install a water pipeline and buried electric distribution power lines for the well pumps from the wellfield to the power plant; provide an access corridor from the power plant to the wellfield for maintenance activities; and provide an access road from existing roads to the power plant. ROWs would be required from the BLM that cover a larger footprint initially to accommodate construction activities that include drilling, trenching, paving, and material/equipment staging. Permanent ROWs would be necessary for the long-term operation and maintenance of all facilities located on BLM-managed public land. ROW grants would include strict liability clauses regarding any environmental damages from releases of hazardous materials.

2.2.1.2 Proposed Toquop Land Disposal Amendment to the Caliente MFP

The BLM could proceed with this *Proposed Toquop Land Disposal Amendment to the Caliente MFP* in order

to identify lands as being suitable for disposal (under Section 203 or 206 of FLPMA) for the Proposed Action. *Section 1.6, Management Framework Plan Amendment Process Overview*, of this document describes the basic steps in the planning process that are used to amend management framework plans. These steps are being carried out as part of this *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*.

2.2.1.3 Pah Rah/Toquop Land Exchange

The BLM could approve the Pah Rah/ Toquop land exchange with NLRC following adoption of this *Proposed Toquop Land Disposal Amendment to the Caliente MFP*, Toquop Energy would then acquire the proposed exchanged parcel, which would serve as the power plant site under the Proposed Action, from NLRC. The Pah Rah/Toquop land exchange is described in *Section 1.4, Background; Section 2.1, Introduction;* and *Section 2.2.2.2, Land Exchange*, of this document.

2.2.2 Description of Project Area, Power Plant Site, and Land Exchange

2.2.2.1 Project Area

Map 2-1 depicts the project area and locations of prominent project features associated with the Proposed Action. The project would be located primarily in Lincoln County, Nevada, but portions of some project features, such as the access road to the power plant site, would be in Clark County, Nevada. Prominent landmarks in the project area include Interstate 15 (I-15) and the Virgin River to the south, the Tule Desert and Tule Spring Hills to the north, and the East Mormon Mountains west of the power plant site (see Map 2-1).

2.2.2.2 Power Plant Site

The Proposed Action power plant site is in T11S, R69E, Section 36, in Lincoln County, Nevada, on public lands administered by the Ely Field Office of the BLM. Toquop Energy would acquire the power plant site from NLRC following completion of the Pah Rah/Toquop land exchange between the BLM and NLRC. The site is approximately 12 miles north-northwest of Mesquite, 70 miles northeast of Las Vegas, 6 miles north of the Lincoln County/Clark County line, and 10 miles west of the Nevada/Utah/Arizona border. Map 2-1 shows the power plant site and associated project features, including the wellfield, water pipeline, and access road. Map 2-4 shows the detailed location of the proposed power plant site.

The 1-mile-square power plant site contains 640 acres of uninhabited public land near the Toquop Wash on the northern boundary of the Mojave Desert. The site is relatively flat, with a 2 percent slope from northwest to southeast, and varies in elevation from 2465 to 2590 feet above mean sea level. The entire site is within the Virgin River Hydrographic Basin (#222). The South Fork Toquop Wash runs within 3/4 mile of the site to the north, and the main stem Toquop Wash runs north/south approximately 1/4 mile east of the site. The Toquop Wash system receives runoff from the Mormon and East Mormon mountains located west and northwest of the site and drains to the Virgin River. The Kern River Natural Gas Pipeline, Navajo-McCullough Electric Transmission Line, and Red Butte-Harry Allen Electric Transmission Line cross the southeast corner of the site (see Map 2-1).

Map 2-4 8-1/2 x 11 color (front)

Map 2-4 8-1/2 x 11 color (back)

2.2.2.3 Land Exchange

This land exchange under the Proposed Action will exchange approximately 640 acres of private land owned by the NLRC in the Pah Rah Range in Washoe County for a similarly valued, BLM-managed parcel of public land near the Toquop Wash in Lincoln County (see *Section 2.2.2.3, Power Plant Site*).

The private parcel of land is owned by NLRC and is located on a mesa at the southern end of the Pah Rah Range in T20N, R23E, Section 9. The Pah Rah parcel consists primarily of open, uninhabited land and is approximately 10 miles west of Fernley and 25 miles east of Reno. Maps 1-1 and 1-2 show the locations of the Toquop Wash and Pah Rah parcels within Nevada. This exchange will be completed as an equal-valued transaction based upon market values determined through federally approved appraisals.

For many reasons, it was determined that more benefit would be derived from an exchange of these parcels than by merely providing BLM ROW grants for the proposed power plant site and appurtenant facilities. The BLM Carson City Field Office desires to acquire this "checkerboard" land to address Washoe County's urban interface/open space issues by providing additional access to public land and resources, while providing watershed and resource (cultural and wildlife [sage grouse habitat]) protection from private development. Development would require new roads into this roadless parcel and would jeopardize these resources. On the other hand, the BLM Ely Field Office wishes to dispose of selected public land to assist county and local governments with community expansion/ economic development opportunities.

All surface and mineral rights and interests would remain with the respective exchanged parcels and transfer to the new owners. No water rights are associated with either parcel and the existing utility rights-of-way on the Toquop parcel would be converted to "easements in perpetuity" should a land patent be issued. Public access would be maintained through the Toquop parcel on an existing access road or on approved access alignments that do not adversely affect the existing utility facilities.

Should this exchange be approved, the Pah Rah parcel would be managed by the BLM as provided in the Carson City Field Office CRMP, which states, "Initiate land exchanges with the Southern Pacific Railroad…to block in lands in the …Olinghouse Allotment(s)." This acquisition proposal also meets all the following Southern Washoe County Urban Interface Plan Amendment criteria for the Pah Rah area:

- Facilitate access to public lands and resources
- Provide resource protection
- Facilitate implementation of the CRMP
- Provide for a more manageable land ownership pattern
- Maintain or enhance public recreational uses and open space values

Washoe County supports this proposed exchange for the public benefits stated above, interests, and protection provided by BLM land use plans. Lincoln County supports this proposed exchange for the opportunities mentioned previously and

improved tax base that would be afforded to the county, which is currently comprised of more than 98 percent federally administered lands. Private development, such as a power plant, would provide additional employment and associated economic opportunities in the surrounding area. Additional taxes afforded by this development would provide revenues to maintain existing public programs and to initiate new programs/services not financially viable at the present time.

2.2.3 Description of Project Features and Operation

2.2.3.1 General

Project features, their operation, and associated actions of the Proposed Action include the following primary elements:

- Issue ROWs by the BLM for constructing and operating the power plant and all related facilities
- *Proposed Toquop Land Disposal Amendment to the Caliente MFP* to identify the southern plant site as suitable for disposal through sale or exchange
- Complete a land exchange between the BLM and NLRC to place the proposed plant site into private ownership
- Construct and operate a 1,100-MW (maximum) combined cycle, natural gas-fired, water-cooled electric generating plant, with connections to a natural gas pipeline and electric transmission lines
- Drill up to an estimated 15 wells in the Tule Desert Basin (Hydrographic Basin #221) over the life of the project sufficient to produce an annual average flow of 3,800 gallons per minute (gpm) (7,100 gpm peak daily) of water for the power plant. It is estimated that the power plant could use up to 7,000 acre-feet of water per year.
- Construct and operate a 12.5-mile-long, 24-inch-diameter buried water pipeline extending from the wellfield in the Tule Desert, through Toquop Gap, to the power plant near the Toquop Wash
- Construct and operate a manifold collection system to interconnect the water output from the wellfield to a pressure-regulating water tank
- Construct and operate a pressure-regulating water tank located near the wellfield before the water pipeline to the power plant
- Construct and operate buried electric distribution power lines from the power plant to the well pumps
- Pave to a width of 24 feet and straightening sections of 14.4 miles of an existing dirt and gravel road (locally known as the Halfway Wash Road and utility corridor road) to produce an access road extending from I-15 to the plant site
- Provide a 12.5-mile-long access right-of-way along an existing dirt and gravel road for maintenance activities between the power plant and the ground water wellfield

The following sections discuss the project features and their operation, including the power plant facilities, road access and transportation, ground water wellfield, and water pipeline. BLM actions associated with these features, which include issuing ROWs, amending the Caliente MFP, and

facilitating the Pah Rah/Toquop land exchange were described in *Section 2.2.1, Description of BLM Actions*.

2.2.3.2 Power Plant Facilities

This section briefly describes how electric power would be produced at the water-cooled power plant. This discussion is intended to familiarize readers with basic concepts and terminology and to promote a better understanding of topics discussed later in this *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*.

Electricity can be generated commercially in several ways, but the common element is the turning of a generator. The source of power that turns the generator distinguishes the different types of power plants. Typical installations use either a diesel engine, a combustion turbine, and/or a steam turbine.

The proposed power plant employs combined cycle technology, which would use combustion turbine generators in series with heat recovery steam generators and steam turbine generators. The exhaust heat from the combustion turbine generator is used in the heat recovery steam generator to produce steam. That steam would drive the steam turbine generator. Use of the original gas fuel energy for the combustion turbine generator and then using the exhaust heat from the combustion turbine generator (which otherwise would go to waste) to produce steam for the steam turbine generator increases the plant's overall efficiency when compared with a combustion turbine generator or steam turbine generator operating alone. Figure 2-1 presents a conceptual rendering of the proposed water-cooled power plant.

The combustion turbine generators would be fueled by natural gas from the 36-inch-diameter Kern River Gas Pipeline, which passes directly through the southeast corner of the Toquop Wash plant site. This pipeline became operational in 1992 and transports natural gas from southwestern Wyoming to southern and south-central California. A tap, meter station, and connective pipeline would be required as part of the project to provide natural gas to the plant. The pipeline meter and tap would be at the main line and would be accomplished without interruption to other natural gas customers.

The power plant would use four combustion turbine generators, four heat recovery steam generators with duct burners, and up to four steam turbine generators. In addition, two natural gas-fired auxiliary boilers would be used to provide startup steam to the steam turbines. The steam from the auxiliary boilers would not be used to generate electricity. Each combustion turbine generator would be composed of a combustion turbine fueled by natural gas, which would be connected to and drive a three-phase, alternating current generator. The hot exhaust of each combustion turbine generator enters an attached heat recovery steam generator. Each heat recovery steam generator is a large, three-pressure heat exchanger/steam generator that would use the hot combustion turbine generator exhaust gas to heat water into high-pressure steam. Natural gas burning duct burners would be included in the heat recovery steam generator to augment steam production. The exhaust gas would enter the heat recovery steam generator at approximately 1,100 degrees Fahrenheit and pass through multiple banks of water-filled tubes, heating the water into low-, intermediate-, and high-pressure steam. The exhaust gas would pass through a

series of emissions control systems and would be vented through an elevated exhaust stack that is 180 feet high. The combined cycle combustion turbines would be dry, low-nitrogen oxide, low-carbon monoxide combustors used in conjunction with selective catalytic reduction in the heat recovery steam generator to control nitrogen oxide emissions.

The steam produced in the heat recovery steam generators would be used to power steam turbines, which would be connected to three-phase electrical generators. Duct firing within the heat recovery steam generators would increase steam production to increase the power production by the steam turbine. Given optimal conditions (operation of duct burners at designed maximum capacity), the energy center could produce up to approximately 1,100 MW. The electric power would be transmitted from the power plant switchyard to the Navajo-McCullough Electric Transmission Line and the Red Butte-Harry Allen Transmission Line, which cross the southeast corner of the plant site. This transmission line is northwest of and parallel to the Kern River Gas Pipeline corridor. Toquop Energy is pursuing a contract to interconnect with the transmission lines. Adequate capacity is available on the lines to transmit Toquop-produced energy.

After steam passes through the steam turbine, in this water-cooled plant, it would be condensed to liquid in the condenser and pumped back to the heat recovery steam generator to repeat the cycle. The condenser would be a large tube-and-shell heat exchanger that operates at a vacuum on the shell (steam) side. Cooling water would flow from the cooling tower through the condenser tubes, pick up residual heat from the steam, and return to the cooling tower. The cooling tower would be a direct-contact heat exchanger in which the cooling water would be sprayed directly into a moving air stream, evaporating a portion of the water to carry heat away from the condenser. In this process, the same water would be used for several cycles. As the well water circulates and evaporates in the cooling tower, the level of dissolved solids in the water would concentrate. A portion of the circulating water would be “blown down to waste” to remove dissolved solids from the circulating water and prevent scale formation on process heat transfer surfaces. This cooling tower blowdown would consist primarily of high concentrations of dissolved solids that occur naturally in the well water used as makeup to the cooling water system. Figure 2-2 shows a schematic of this combined cycle electric power production process.

While this would be a 1,100-MW plant (maximum), it is important to note that two-thirds of the power generated would come from the combustion turbines while one-third would come from the steam turbines. Therefore, water use and consumption would be equivalent to that of a 360-MW steam plant.

Blowdown from the steam cycle would go to a brine concentrator and then be further managed onsite using a geomembrane double-lined equalization pond and double-lined evaporation pond. Each liner would be 60 mils thick. The onsite equalization pond would be managed to keep the water chemistry balanced for use in the cooling system. No wastewater would be discharged from the ponds to any surface water or offsite treatment facilities. Solids filtered or settled from the wastewater in the recycle process would be removed from

Figure 2-1 8-12 x 11 color (front)

Figure 2-1 8-12 x 11 color (back)

Figure 2-2 8-12 x 11 color (front)

Figure 2-2 8-12 x 11 color (back)

the site regularly, and disposed of at an approved offsite disposal facility.

The power plant, switchyard, equalization and evaporation ponds, and associated facilities would cover approximately 100 acres. This acreage would be surrounded by an 8-foot-high chain link fence that meets desert tortoise exclusion requirements. The fence would enclose the following structures:

- **Combustion Turbine Generators.** These natural gas-fired combustion turbines would each be directly connected to an 18-kilovolt (kV), three-phase generator. Combustion gases from the turbines would exhaust into the heat recovery steam generators.

- **Heat Recovery Steam Generators.** These steam generators would use the heat of the gas turbine exhaust to produce low-, intermediate-, and high-pressure steam. The steam from each pair of heat recovery steam generators would be used to drive a steam turbine generator.

- **Heat Recovery Steam Generator Stacks.** These cylindrical stacks would be 180 feet high, 18 feet in diameter, and carry the 170- to 195-degree Fahrenheit heat recovery steam generator exhaust above surrounding buildings. An air quality sampling platform would be constructed on each stack for stack testing and combustion emissions equipment.

- **Steam Turbine Generators.** These steam turbines would use steam produced by the heat recovery steam generators to drive 18-kV, three-phase generators. The steam would exhaust into a condenser, return to its liquid state, and be recycled back into the heat recovery steam generators.

- **Condenser.** A large shell-and-tube heat exchanger would attach to the steam turbine exhaust side, which would condense exhaust steam from the steam turbine. The condensate would be recovered and chemically conditioned to minimize corrosion and scale formation for reuse in the system. Chemicals used (such as oxygen scavenger, amine solutions, and phosphate solutions) would be stored within spill containment areas in self-contained storage systems called totes (typical volume of 400 gallons) in the water treatment building in compliance with federal, state, and local regulations.

- **Cooling Towers.** Mechanical-draft wet cooling towers would be used to reject heat from the steam condenser to the atmosphere by evaporating a portion of the circulating water. The circulating water would be treated with small amounts of chemicals such as scale inhibitors, sulfuric acid, and sodium hypochlorite to minimize scale formation, maintain pH, and inhibit biological growth, respectively. Sulfuric acid and sodium hypochlorite would be stored in aboveground vertical tanks within secondary containment. The other lesser inhibitors and treatment chemicals would be stored in totes located within secondary containment. The storage for these totes would be inside the storage building located near the cooling towers. Water would be recycled through the towers at least ten times prior to discharge.

- **Equalization Pond.** A 5-acre uncovered equalization pond would be constructed onsite to keep the water

chemistry balanced for use in the cooling system. This pond would be sealed with a 60-mil-thick double liner.

- **Evaporation Pond.** A 20-acre uncovered evaporation pond would be constructed onsite to handle the disposal of all wastewater. The pond would be sealed with a double liner. Each liner would be 60 mils thick. No wastewater would be discharged from the facility to any surface water or offsite treatment facilities, which would be consistent with state requirements for a ground water discharge permit. Dry solids from water treatment would be disposed of offsite at a licensed landfill.

- **Electrical Switchyard.** Electricity generated by each of the four combustion turbine generators and the steam turbine generators would be increased from 18 kV to 500 kV and transferred to the Navajo-McCullough Electric Transmission Line located on the plant site. Electricity produced at the power plant would be sold to the wholesale market through the Navajo-McCullough Electric Transmission Line (Western Transmission System). The Nevada-McCullough Transmission Line has adequate capacity to transmit the electricity that would be generated by the Proposed Action. A portion of the electricity could be stepped up to 345 kV and transferred to the existing Red Butte-Harry Allen 345-kV line in the utility corridor. This line, owned by Nevada Power, has sufficient capacity to transmit the electricity that would be generated by the Proposed Action.

It is anticipated that hazardous materials as defined in Appendix B will be used, transported, or stored during the construction and operation of the power plant.

The Toquop Energy Project is seeking approvals to operate up to 24 hours per day, 365 days per year, and would require approximately 25 full-time employees.

2.2.3.3 Road Access and Transportation

The power plant site would be accessible from I-15 via the East Mesa Interchange, which is 13 miles west of Mesquite (see Map 2-1). Approximately 14.4 miles of an existing dirt and gravel road (Halfway Wash/utility corridor road) would be paved to a width of 24 feet, and some sections would be straightened to produce an access road extending from I-15 to the plant site. Table 2-1 summarizes acres of land in Clark County and Lincoln County that would be temporarily disturbed and reclaimed or permanently disturbed by the construction upgrades and operation of the existing access road.

The construction right-of-way for this 14.4-mile-long access road (5.2 miles in Clark County and 9.2 miles in Lincoln County) would be quite variable in width because of variation in terrain and would occupy 246 acres. This access road presently occupies 30 acres. The net new construction right-of-way disturbance from the widened access road would be 216 acres.

Staging areas required for road construction would total an additional 20 acres (all in Lincoln County) and would be reclaimed. The long-term right-of-way for the access road would occupy 138 acres. The net new permanent impacts (which include the road surface and adjacent road shoulders) within the long-term right-of-way would be 65 acres, 23 acres of which would be in Clark County and 42 acres of which would be in

TABLE 2-1
Land in Clark County and Lincoln County Affected by the Access Road

	Clark County (acres)	Lincoln County (acres)	Total (acres)
Construction right-of-way for access road	89	157	246
Existing access road	10	20	30
Net new construction right-of-way disturbance	79[a]	137[b]	216
Staging areas	0	20[a]	20
Long-term right-of-way for access road	50	88	138
Net new permanent disturbance within long-term right-of-way[c]	23	42	65

[a] All within the Mormon Mesa ACEC
[b] 123 acres within the Mormon Mesa ACEC
[c] Except for these acres, all other lands disturbed as a result of project activities in the construction right-of-way, permanent right-of-way, and staging areas would be reclaimed.

Lincoln County. Except for these 65 acres, all other lands temporarily disturbed during road construction would be reclaimed. Road-related temporary disturbances on lands administered by the Las Vegas and Ely Field Offices of the BLM would be restored according to restoration plan requirements for each of those offices, which would be addressed in the POD. No new roads would be required for site access.

This low-speed but serviceable road is the primary access for maintaining a microwave station, communications equipment optical fiber lines, natural gas pipelines, and electric transmission lines located on the southern end of the East Mormon Mountains. The Proposed Action would use this existing road as the primary site access. This would require that the road be regraded, a suitable base material installed, and then paved for all-weather use. The existing road would require straightening in some locations where it has very-small-radius turns. Some dry washes exist where culverts or other materials would be installed to prevent road damage during periods of excessive runoff. Minor improvements would be required on the frontage road at the I-15 interchange to handle large construction equipment and the largest components of the power plant itself.

The desert tortoise is a federally protected species under the terms of the Endangered Species Act (ESA). Measures to protect desert tortoise and their habitat will be described in the terms and conditions of ROWs issued by the BLM and would be followed during road upgrading and use (see *Section 2.2.5, Best Management Practices and Standard Operating Procedures* and *Appendix A, Measures for Protecting Desert Tortoises and Their Habitat*, for detailed descriptions). In addition, upgrading the road will meet requirements of the Caliente MFP, the Las Vegas RMP, and the POD. These protective measures are especially important because this access road passes through the Mormon Mesa Area of Critical Environmental Concern (ACEC), so designated because of the presence of desert tortoise critical habitat. All but the

northernmost 0.9 mile of the access road is in the Mormon Mesa ACEC (see Table 2-1).

2.2.3.4 Wellfield

Ground water is proposed for use in all power plant operations and for cooling water under the Proposed Action. Approximately 3,800 gallons per minute (gpm) of water would be required to supply the power plant under annual average design operating conditions. Because of higher cooling demands, the average water use during the summer months would be approximately 5,500 gpm (approximately 2,190 acre-feet of water from June through August). The peak daily use of water could require up to 7,100 gpm (31 acre-feet of water per day). It is estimated that the power plant would require up to 7,000 acre-feet of water per year. More than 90 percent of this water (approximately 6,300 acre-feet) would be used by an evaporative cooling tower system. The remainder would be filtered, if necessary, to provide service water, potable water, and water for the demineralized water treatment system. That system would supply the high-purity water needs of the heat recovery steam generators.

The Proposed Action includes the development of a wellfield in the Tule Desert Hydrographic Basin (#221) to supply ground water to the power plant. Although a significant amount of work has been completed to characterize the ground water resources (CH2M HILL, 2002), additional studies are currently underway to determine the exact number and location of these wells. For purposes of analysis in this document, it is assumed that up to 15 deep wells, each with a pump enclosed by a small building, would be required over the life of the project. A manifold system would interconnect the output from each of these wells to a single 24-inch-diameter buried pipeline. That pipeline and buried electrical distribution power lines in the same right-of-way would extend from the Tule Desert to the Toquop Wash plant site approximately 12 miles away.

Although the exact location of each well is not yet known, they would be spatially dispersed in the southern third of the Tule Desert (see Map 2-1). The wells would be located as close as possible (within 300 feet) to one of the several existing dirt roads that crisscross this area. The maximum disturbed surface area for each well would be approximately 1 acre. This would consist of approximately 1/3 acre for the new 300-foot-long access road and pipeline, which would have a 60-foot-wide construction right-of-way, and approximately 2/3 acre for construction activities at the well site. The total area disturbed would range up to 15 acres, depending on how many wells are drilled. Because the collection pipelines and associated electrical service lines would be located in existing roads, no new disturbance would result.

In addition to the wells and manifold system, a raw water storage tank of approximately 500,000 gallons (configuration and color to be determined during final design to blend with background conditions) would be built to maintain constant flow in the pipeline. This storage tank would be located above ground as close as possible to the production well farthest downstream and would feed water by gravity to the power plant. The maximum disturbed area for the storage tank would be 1 acre. An existing 12.5-mile-long road from the power plant site to the wellfield would be used occasionally to provide access for maintenance and monitoring of production wells.

Permanent water rights that would be required to supply up to 7,000 acre-feet of water per year from the Tule Desert wellfield necessary to operate the Toquop Energy Project under the Proposed Action have been jointly applied for by Vidler Water Company, Inc. (a sister company of NLRC) and Lincoln County. Toquop Energy would lease and use these water rights for the 42-year life of the project. The Nevada State Engineer (Ruling Number 5181) has approved 2,100 acre-feet of water per year of the Vidler Water Company - Lincoln County water right applications. Vidler Water Company - Lincoln County have an application for additional water allocations adequate to operate the power plant. The application is being held for action pending results of additional hydrologic studies requested by the Nevada State Engineer.

As part of the process in which these water rights were granted, the installation of a monitoring well is required downgradient of the southernmost production well. This monitoring well along with other wells in the wellfield would be used to assess effects of withdrawal from the deep aquifer. The maximum disturbed surface area for this specific downgradient well would be approximately 1 acre. Ground water monitoring is discussed further in Section 4.4.1.1.2.

2.2.3.5 Water Pipeline

Ground water withdrawn from the Tule Desert wellfield would be pumped and gravity-fed through a 24-inch-diameter ductile iron or steel pipeline 12.5 miles to the power plant site. Pipeline capacity would only be sufficient for the Toquop Energy Project. The pipeline route does not follow existing roads except near the wellfield. The pipeline would run south-southwest for approximately 5 miles, crossing Sam's Camp Wash west of the East Mormon Mountains, and then proceed east approximately 3/4 mile through the Toquop Gap (Map 2-1). It would then turn south-southeast for approximately 6 miles directly to the plant site. The line would cross the South Fork Toquop Wash 1-1/2 miles north of the proposed plant site. The wash is approximately 80 feet deep at the proposed pipeline crossing point.

The pipeline would be buried deep, well below potential streambed scour, erosion, and exposure, and away from potential lateral bank migration. The potential for both scour and lateral bank migration would be studied further during final design to determine burial depth necessary to protect the pipeline from exposure and failure during floods. Open-cut construction techniques would probably preclude reestablishing the vertical wall in some sections of the canyon.

Steel pipe, if used, would be lined with cement mortar, have a dielectric coating, and have a cement-mortar coating (rock shield) on the exterior of the pipe. The type of dielectric coating would depend on the corrosivity of the soil and would be determined during final design. Ductile iron pipe, if used, would also be cement-mortar lined, with an asphaltic 1-mil-thick exterior coating, and a polyethylene encasement in areas of corrosive soil, also to be determined during final design.

The temporary right-of-way for pipeline construction would be 60 feet wide to allow for soil disturbance during pipeline trenching, laying, backfilling operations, and laying of the electrical lines to the wellfield. Staging areas during pipeline construction would consist of a 3-acre area at the northern end of the pipeline in Section 4; a 3-acre area midway along the

pipeline just east of the Toquop Gap; and 3 acres at the power plant site. Because the acreage for the third area is included in the total for the power plant site, the water pipeline staging areas are considered to total 6 acres. After construction, a long-term 30-foot-wide right-of-way would be sufficient for maintenance activities. The construction and long-term rights-of-way for the 12.5-mile-long water pipeline would include approximately 90 acres and 45 acres, respectively. All disturbed lands within these rights-of-way and staging areas would be reclaimed. Maintenance would include periodic inspection of the entire route and routine exercising of all valves in the system. It is anticipated that this activity could be supported using low-impact all-terrain vehicles (ATVs). Should major maintenance or repair be required, most equipment could be supplied by helicopter or four-wheel drive vehicles to eliminate the need for a permanent access road. Vegetation would be reestablished in the disturbed surface areas over time according to measures described in *Section 2.2.5, Best Management Practices and Standard Operating Procedures*. Signs would be posted to discourage recreational use of this right-of-way and to warn of electrical hazards in the event of excavation.

2.2.4 Construction Activities

The construction phase for the access road, power plant, and water pipeline would start between mid-2003 and the end of 2004. The exact start of construction will be refined as part of the overall development process. Construction would last for approximately 26 months. The average construction crew is estimated to be approximately 500 people. Normal construction hours would be from 6 a.m. to 3 p.m. on weekdays; however, some activities would require extended operation hours for scheduling constraints, to maintain structural integrity of concrete pours, or for other time-sensitive matters.

Construction activities would include the following four phases:

- Site clearing and preparation
- Foundation construction
- Building and equipment installation
- Site cleanup and project start-up

2.2.4.1 Site Clearing and Preparation

Site clearing and preparation would require heavy, diesel-powered earthmoving equipment including bulldozers, scrapers, dump trucks, and front-end loaders. Site clearing and preparation would occur at all locations where equipment would be constructed or installed and along the access road to be widened. Some blasting is anticipated, depending on site-specific conditions at the various construction sites and the results of geotechnical field investigations during final design. The amount of cut and fill would be estimated during detailed final design, pending approval of the ROWs and acquisition of required permits. Table 2-2 presents an estimate of the number, type, and length of use of construction equipment.

The size of the area used for borrow material would depend on the suitability of available materials and be determined during final design. However, all borrow material would come from areas that would be disturbed during construction of the power plant and ponds. If additional borrow material is needed, it would come from an existing offsite commercial facility. No new borrow areas would be constructed for this project.

TABLE 2-2
Time and Equipment Construction Requirements for the Proposed Action

Component	Equipment	Capacity (horsepower)	Fuel Type	Number of Units	Use Days (per unit)	Total Use (in days)
Power Plant (730 days)						
	Excavator/Trackhoe	250	Diesel	4	50	200
	D10 bulldozer	400	Diesel	1	175	175
	Front-end loader	200	Diesel	2	730	1,460
	Backhoe	200	Diesel	3	120	360
	Crane	225	Diesel	6	135	810
	Water truck	300	Diesel	2	250	500
	Concrete truck (20,000 cubic yards; 2,000 trips)	325	Diesel	12	80	960
	Dump truck	250	Diesel	3	80	240
	Material delivery truck (3,000 trips)	250	Diesel	—	—	1,500
	Concrete pump truck	400	Diesel	1	120	120
	Loader	100	Diesel	1	290	290
	Fork lift truck	100	Diesel	6	235	1,410
	Electric generator	5	Gasoline	10	200	2,000
	Pick-up truck	150	Gasoline	3	730	2,190
	Welder	250 amps	Electric	15	60	900
Access Road Construction (180 days)						
	D8 bulldozer	400	Diesel	2	120	240
	D6 bulldozer	300	Diesel	2	120	240
	Scraper	300	Diesel	4	120	480
	Water truck	250	Diesel	2	150	300
	Pick-up truck	200	Diesel	2	150	300
	Asphalt trucks	250	Diesel	6	60	360
Water Pipeline Construction (90 days)						
	Trackhoe	300	Diesel	2	80	160
	D6 bulldozer	300	Diesel	2	80	160
	Pick-up truck	150	Diesel	2	90	180
	Pipe delivery truck	250	Diesel	1	80	80

During construction, up to 125,000 gallons (0.4 acre-foot) of water would be used daily. This water would be acquired from the permanent ground water system for the project. Water uses during the construction phase would include dust control, concrete curing, and hydrostatic testing of completed pipelines and heat recovery steam generators. Only bottled water would be used for human consumption.

During construction, diesel-powered generators would produce the required electricity. Generators would be connected to an onsite transformer for distribution to electrically powered construction tools and equipment. Communications during construction would be accomplished via a microwave tower that would be constructed on the power plant site.

An estimated 449 acres would be disturbed and/or included in construction rights-of-way under the Proposed Action. All but 79 acres would be in Lincoln County. This total would consist of 100 acres that would be fenced and enclose the power plant, switchyard, equalization and evaporation ponds, associated facilities, and a lay-down area; 216 acres of new disturbance for the access road (79 acres in Clark County and 137 acres in Lincoln County); up to 15 acres for the wellfield; 1 acre for the monitoring well; 1 acre for the storage tank; 90 acres for the water pipeline; and 26 acres for staging areas (20 acres for the access road and 6 acres for the water pipeline). Disturbed lands within rights-of-way would be reclaimed as a component of the Proposed Action according to measures described in *Section 2.2.5, Best Management Practices and Standard Operating Procedures.* Long-term disturbances would total 182 acres and consist of 100 acres for the fenced power plant site; 17 acres for the wellfield, monitoring well, and storage tank; and 65 acres of net new disturbance for the access road (23 acres in Clark County and 42 acres in Lincoln County). Other lands disturbed during construction along the access road, in the pipeline right-of-way, and at staging areas (267 acres) would be reclaimed.

2.2.4.2 Foundation Construction

Foundation construction would involve concrete handling equipment such as concrete trucks, mixers, vibrators, and pumps. Some earth-moving equipment also would be required to backfill the foundations. Any blasting activities that may be required would occur for as short a duration as possible and would be limited to daytime.

2.2.4.3 Building and Equipment Installation

Building and equipment installation would involve mobile cranes, equipment delivery, impact wrenches, grinders, and air compressors. Activities would be restricted to the power plant site, except for the water pipeline and the water storage tank to be constructed in the Tule Desert and the widening of the access road.

2.2.4.4 Site Cleanup and Facility Start-Up

Site cleanup and power plant start-up would generally require minimum amounts of heavy machinery. It would primarily include flushing pipes, blowing out steam lines, and testing equipment and controls.

2.2.5 Best Management Practices and Standard Operating Procedures

Activities under the Proposed Action would consist of two sets of actions that are a specifically directed and an integral part of the Proposed Action. The first set of actions would be to comply with the terms and conditions of all ROWs issued by the BLM. The second set of actions would be to follow best management practices (BMPs) and standard operating procedures (SOPs) typically associated with the construction, operation, and maintenance of power plants, wellfields, pipelines, other utility corridors, and related facilities in this region of the western United States. These BMPs and SOPs would be followed to avoid or minimize the potential for adverse environmental effects resulting from project-related activities. Special emphasis would be placed on protecting desert tortoise and their habitat. *Appendix A* lists management prescriptions for desert tortoise habitat that are consistent with the Desert Tortoise Recovery Plan, relevant HCPs, and other identified management documents, and which would be followed during project construction, operation, and maintenance activities. *Appendix B, Standard Construction and Operation Procedures,* describes BMPs and SOPs for the following activities:

- Landscape preservation and impact avoidance
- Erosion and sediment control
- Pipeline and utility corridor construction
- Biological resources
- Cultural resources
- Site restoration and revegetation
- Visual resources
- Water pollution prevention and monitoring
- Transportation
- Noise and air pollution prevention
- Hazardous material storage, handling, and disposal, and safety measures

The final POD will detail the methods and procedures to be used in the construction of the power plant, access road, and ancillary facilities. The POD will incorporate site-specific stipulations, terms, and conditions in order to satisfy all project-related construction requirements, as well as operational, maintenance, and restoration requirements associated with lands administered by the Ely and Las Vegas Field Offices of the BLM where project features would be located.

Appendix C, Cultural Resources Programmatic Agreement, contains the Cultural Resources Programmatic Agreement with stipulations to ensure that historic and prehistoric properties will be treated to avoid or mitigate project-related effects to the extent practical and to satisfy BLM Section 106 responsibilities. Mitigation measures specific to various resources present in the project area are referenced in *Chapter 4, Environmental Consequences*.

2.2.6 Decommissioning

The proposed power plant would have a life expectancy of 42 years, including construction. At the end of its useful life, the power plant would be decommissioned. At decommissioning, all

structures and equipment at the site would be dismantled and removed. The onsite evaporation and equalization ponds would be excavated to remove sediment. The excavated material would be tested and disposed of at an approved offsite disposal facility. All pond liners would be removed and the land surface would be regraded. The water pipeline and electric distribution line would be closed and left in place. All wells would be decommissioned and abandoned in accordance with state regulations. Use of the water rights by Lincoln County after the 42-year project life is unknown.

2.3 Alternative 1

2.3.1 Description of BLM Actions

BLM actions that could occur under Alternative 1 include issuing ROWs necessary for project construction and operation, proceeding with this *Proposed Toquop Land Disposal Amendment to the Caliente MFP*, and completing the Toquop land disposal through sale or exchange. The ROW issued by the BLM for the construction and operation of a water pipeline and buried electric distribution power lines under Alternative 1 would be for an eastern rather than a western alignment. This alternative alignment is depicted in Map 2-2 and described below in *Section 2.3.3.1, Water Pipeline.*

2.3.2 Description of Project Area, Land Disposal, and Power Plant Site

Map 2-2 depicts the project area, land disposal parcel, and power plant site associated with Alternative 1. The water pipeline and buried electric distribution power lines would follow a more easterly alignment under Alternative 1 than under the Proposed Action. The power plant site, located in T11S, R69E, Section 36, in Lincoln County (see Map 2-4), would be available for disposal through sale or exchange.

2.3.3 Description of Project Features and Operation

Project features (see Map 2-2), their operation, and associated actions under Alternative 1 would be the same as those described for the Proposed Action (see *Section 2.2.3, Description of Project Features and Operation*), except for the water pipeline and buried electric distribution power lines, which are described in the following text. Otherwise, the power plant and associated facilities, road access and transportation between I-15 and the power plant site, and the ground water wellfield would be the same as described for the Proposed Action.

2.3.3.1 Water Pipeline

The water pipeline would follow a more easterly alignment under Alternative 1 than under the Proposed Action. This eastern alignment would follow the existing road that extends south-southeast from the Tule Desert to the Toquop Wash plant site, with one exception. On its southern end, the pipeline would depart from the road and follow along the west side of a range line south for about 3 miles in order to avoid the FWS-designated desert tortoise critical habitat, which is on the east side of the rangeline in this area (see Map 2-2 and desert tortoise discussions in *Section 3.1, Threatened, Endangered, and Sensitive Species*). The ground water well pumps would pump directly to a raw water storage tank located on an intermediate high point several

miles southeast of the wellfield. The aboveground storage tank (configuration and color to be determined during final design to blend with background conditions) would then feed the water by gravity to the power plant. The storage tank would have a capacity of approximately 500,000 gallons and disturb no more than 1 acre of land. Electric distribution power lines from the power plant to the well pumps would be buried adjacent to the water pipeline.

The total length of this water pipeline would be 12.6 miles, or 0.1 mile longer than the more westerly route described for the Proposed Action. Its construction ROW (60 feet wide and 92 acres) and long-term right-of-way (30 feet wide and 46 acres) would be nearly identical in size to the western alignment under the Proposed Action. It would also have three 3-acre staging areas for construction: one near the north end; one near the mid-point of the pipeline; and one in the power plant site. Because the acreage for the third site is included in the total for the power plant site, water pipeline staging areas are considered to total 6 acres. All disturbed lands within these rights-of-way and staging areas would be reclaimed. Approximately 85 percent of the pipeline would run next to the existing road. This would provide easier, quicker access than the western alignment for larger vehicles should major maintenance or repair be necessary. In addition to being slightly longer, this alternative pipeline route would cross the main stem of the Toquop Wash at one of its deepest points (140 feet).

2.3.4 Construction Activities

Construction activities associated with site clearing and preparation, foundation construction, building and equipment installation, and site cleanup and facility start-up would be the same as those described for the Proposed Action (see *Section 2.2.4, Construction Activities*). Because of their nearly identical lengths, time and equipment requirements for constructing the eastern pipeline alignment under Alternative 1 would be the same as presented in Table 2-1 for the western pipeline alignment under the Proposed Action. Acres of lands disturbed and/or included in construction ROWs would be nearly identical to the Proposed Action, totaling approximately 451 acres (372 acres in Lincoln County and 79 acres in Clark County). Long-term disturbances would total 182 acres, the same as for the Proposed Action, with 269 acres being reclaimed.

2.3.5 Best Management Practices and Standard Operating Procedures

Activities that are a specifically directed and an integral part of Alternative 1 would be the same as those described for the Proposed Action (see *Section 2.2.5, Best Management Practices and Standard Operating Procedures*). They would consist of: complying with the terms and conditions of all ROWs issued by the BLM; the protection of desert tortoise habitat as described in *Appendix A*; following BMPs and SOPs listed in *Appendix B* that are associated with project construction, operation, and maintenance activities; and complying with stipulations of the *Cultural Resources Programmatic Agreement* contained in *Appendix C*.

2.3.6 Decommissioning

Decommissioning of the power plant site under Alternative 1 would be the same as

described for the Proposed Action (see *Section 2.2.6, Decommissioning*).

2.4 Alternative 2

2.4.1 Description of BLM Actions

BLM actions that could occur under the Alternative 2 include issuing ROWs necessary for project construction and operation, proceeding with this *Proposed Toquop Land Disposal Amendment to the Caliente MFP*, and completing the Toquop land disposal through sale or exchange.

However, specific actions could differ because of differences in the parcels of land to be disposed, location of the power plant site, and the nature and extent of the utility corridor and access road (see Map 2-3). In addition to the ROWs described for the Proposed Action, the BLM would issue ROWs for the construction and operation of an extended access road, a buried natural gas pipeline, and an overhead electric transmission line corridor that would be necessary for this northern power plant site. However, the water pipeline ROW would not be needed for this alternative. The BLM could amend the Caliente MFP in order to identify a parcel of public land in the Tule Desert in Lincoln County that is presently being managed by the BLM as being suitable for disposal through sale or exchange. The Tule Desert parcel would then serve as the power plant site under Alternative 2.

2.4.2 Description of Project Area, Land Disposal, and Power Plant Site

Map 2-3 depicts the project area, land disposal parcel, and power plant site. The overall project area for this alternative is the same as for the Proposed Action, although the locations of many of the project features would differ. Under Alternative 2, the power plant site shown on Map 2-5 would be located on the Tule Desert parcel in T10S, R69E, Section 4, approximately 12 miles north-northwest of the Toquop Wash site.

2.4.3 Description of Project Features and Operation

The features (see Map 3-2), operation, and associated actions for the power plant and wellfield would be the same for Alternative 2 as for the Proposed Action (see *Section 2.2.3, Description of Project Features and Operation*). Under Alternative 2, the power plant would be located adjacent to the wellfield in the Tule Desert. This would eliminate the need for constructing a long water pipeline, but would add the need for an electric transmission line and gas pipeline of 12.0 miles each. This location also is the site of one recently drilled potential production well. The well was drilled to gather data concerning the yields available from the ground water resources in this area, which would provide information necessary for the final design of the wellfield. Differences in the utility corridor and access road compared to the Proposed Action are described in the following text.

2.4.3.1 Utility Corridor

Locating the power plant in the Tule Desert under Alternative 2 would require the construction of 12.0 miles of buried natural gas pipeline to bring fuel to the site, and 12.0 miles of an overhead electric transmission interconnection to carry net power production to the Navajo-McCullough Electric Transmission Line and the Red Butte-Harry Allen Electric

Map 2-5 8-1/2 x 11 color (front)

Map 2-5 8-1/2 x 11 color (back)

Transmission Line. It is anticipated that the gas pipeline would be 20 inches in diameter and the transmission interconnection would be 500-kV and 345-kV overhead lines, similar to the receiving transmission line. Both lines would be placed in a 120-foot-wide right-of-way adjacent to an existing road. Because of its width, construction staging areas would be located within the right-of-way. This 12.0-mile-long right-of-way would contain 175 acres. All disturbed lands in the corridor would be reclaimed except for that portion of the improved access road (discussed in *Section 2.4.3.2, Road Access and Transportation*) that would be located within the utility corridor.

Except at their southern ends, these two utility interconnection lines would follow the eastern water pipeline alignment described for Alternative 1 (see Maps 2-2 and 2-3 for alignment comparison). Neither the gas pipeline nor the electric line would cross the Toquop Wash, but would cross the range line into the FWS-designated desert tortoise critical habitat area. The utility lines would originate in T11S, R70E, Section 30, just east of the wash where the Kern River Gas Pipeline and the Navajo-McCullough Electric Transmission Line and Red Butte-Harry Allen Electric Transmission Line are in proximity. Starting the utility corridor at this point prevents 0.2 mile of habitat disturbance and completely avoids the difficult crossing of the Toquop Wash.

2.4.3.2 Road Access and Transportation

Constructing an additional 12.2 miles of access road would be required to reach the plant site under Alternative 2. This access road would continue from its proposed terminus described for the Toquop Wash power plant site under the Proposed Action, cross the Toquop Wash, proceed north through desert tortoise critical habitat (but outside an ACEC) for approximately 4.3 miles to the range line, then continue along the existing dirt road alignment to the Tule Desert plant site. This alignment would involve extensive grading, sub-base preparation, straightening, and paving of this primitive road, except where the road crosses the Toquop Wash. At this location, the road would only be smoothed and flattened slightly to facilitate the passage of larger construction equipment. In the event of intermittent flooding, access across the Toquop Wash would be delayed until flood waters subside or, alternatively, the power plant site would be accessed via the Carp-Elgin Road.

Of the 26.6-miles-long access road, the construction right-of-way for the 14.4 miles of upgraded access road from I-15 to the Toquop Wash site would disturb an additional 216 acres of habitat, plus require 20 acres for staging areas, the same as for the Proposed Action. After reclamation the net new disturbance for this 14.4-mile segment would be 65 acres (23 acres in Clark County and 42 acres in Lincoln County) (see Table 2-1). In addition, the southernmost 4.3 miles of the additional 12.2-mile road extension to the plant site would lie in a separate construction right-of-way (outside of ACECs) that includes approximately 53 acres. The net new disturbance following reclamation would be approximately 19 acres in the 4.3-mile segment. The remaining 7.9 miles of road would lie within the 120-foot-wide utility corridor right-of-way with the natural gas and electric lines. The net new disturbance from the 7.9-mile-long road segment would be approximately 36 acres. Any additional staging areas for the 12.2-mile road extension would be located within the

120-foot-wide utility corridor right-of-way and reclaimed following construction.

2.4.4 Construction Activities

The general types of construction activities associated with site clearing and preparation, foundation construction, building and equipment installation, and site cleanup and facility start-up would be the same as those described for the Proposed Action (see *Section 2.2.4, Construction Activities*). However, because of the proposed power plant location under Alternative 2, approximately twice the effort would be required to construct the access road compared to the Proposed Action (see Table 2-1). In addition, extending the natural gas pipeline and the electric transmission line under Alternative 2 would require substantially more effort than constructing the water pipeline under the Proposed Action.

An estimated 581 acres would be disturbed and/or included in construction rights-of-way for Alternative 2 (all but 79 acres would be in Lincoln County). This total would consist of 100 acres that would be fenced and enclose the power plant, switchyard, equalization and evaporation ponds, associated facilities, and a lay-down area; up to 15 acres for the wellfield; 1 acre for the monitoring well; 1 acre for the storage tank; 269 acres for the access road (216 acres in the initial 14.4 miles and 53 acres in the next 4.3 miles); 175 acres for the utility corridor; and 20 acres for staging areas. Disturbed lands within rights-of-way would be reclaimed, as described in the preceding text. Remaining long-term disturbances would total 237 acres and consist of 100 acres for the fenced power plant site; 17 acres for the wellfield, monitoring well, and storage tank; and 120 acres (23 acres in Clark County and 97 acres in Lincoln County) of net new disturbance for the access road. Other lands disturbed during construction along the access road, in the utility corridor, and at staging areas (344 acres) would be reclaimed.

2.4.5 Best Management Practices and Standard Operating Procedures

Activities under Alternative 2 would be the same as those described for the Proposed Action (see *Section 2.2.5, Mitigation and Enhancement*). They would consist of: complying with the terms and conditions of all ROWs issued by the BLM; protecting desert tortoise habitat as described in Appendix A; following BMPs and SOPs listed in Appendix B that are associated with project construction, operation, and maintenance activities; and complying with stipulations of the *Cultural Resources Programmatic Agreement* contained in Appendix C.

2.4.6 Decommissioning

Decommissioning of the power plant site under Alternative 2 would be the same as described for the Proposed Action (see *Section 2.2.6, Decommissioning*).

2.5 Alternative 3

2.5.1 Description of BLM Actions

BLM actions that could occur under the Proposed Action include issuing ROWs necessary for project construction and operation, proceeding with this *Proposed Toquop Land Disposal Amendment to the*

Caliente MFP, and completing the Toquop land disposal through sale or exchange.

2.5.2 Description of Project Area, Land Disposal, and Power Plant Site

Project features (see Map 2-1), their operation, and associated actions under Alternative 3 would be the same as those described for the Proposed Action (see *Section 2.2.3, Description of Project Features and Operation*), except that the power plant would be air-cooled. Map 2-6 shows the detailed location of the power plant site for Alternative 3.

2.5.3 Description of Project Features and Operation

2.5.3.1 General

Project features, their operation, and associated actions of Alternative 3 would be the same as the Proposed Action except for the following:

- Construct and operate an air-cooled combined cycle, natural gas-fired electric generating plant, with connections to a natural gas pipeline and electric transmission line. At the maximum anticipated summertime ambient temperature of 115°F, the air-cooled plant could produce up to approximately 947 MW. For comparison, the water-cooled plant could produce up to approximately 1,034 MW at the same ambient temperature.

- Drill up to an estimated three wells in the Tule Desert Basin (Hydrographic Basin #221) over the life of the project sufficient to produce an annual average flow of 100 gallons per minute (gpm) (200 gpm peak daily) of water for the power plant. It is estimated that the power plant could use up to approximately 170 acre-feet of water per year.

- Construct and operate a 12.5-mile-long, 4-inch-diameter buried water pipeline extending from the wellfield in the Tule Desert, through Toquop Gap, to the power plant near the Toquop Wash

- Construct and operate a small manifold collection system to interconnect the water output from the wellfield to a pressure-regulating water tank

- Construct and operate a small pressure-regulating water tank located near the wellfield before the water pipeline to the power plant

2.5.3.2 Power Plant Facilities

This section briefly describes the differences in power plant facilities between Alternative 3 (air-cooled plant) and the Proposed Action (water-cooled plant), which was described in *Section 2.2.3.2, Power Plant Facilities*. Figure 2-3 presents a conceptual rendering of the Alternative 3 air-cooled plant.

The production process for the air-cooled plant is the same as for the water-cooled plant until after the steam passes through the steam turbines. After steam passes through the steam turbine, it would be condensed to liquid in the condenser and pumped back to the heat recovery steam generator to repeat the cycle, the same as for the Proposed Action. However, for Alternative 3, the condenser would be a large finned-tube heat exchanger that operates at vacuum within the tubes. Large fans would be used to push air across the

tubes, transferring the heat from the condensing steam to the ambient air. Depending on vendor designs, the condensers would consist of either two or four units with a total of approximately 12 bays with five fans per bay. Each of these 60 fans would be approximately 30 feet in diameter and equipped with a 200-horsepower electric motor. Overall power consumption of the total condensing system would be approximately 9,200 kilowatts (kW). The condensing system would cover at least 2.2 acres and be approximately 87 feet tall. Figure 2-2 shows a schematic of this combined cycle electric power production process.

Blowdown from the steam cycle and wastewater created by production of ultra-pure steam cycle makeup water would go to a brine concentrator and then be further managed onsite using a geomembrane double-lined equalization pond and double-lined 3- to 5-acre evaporation pond. Each liner would be 60 mils thick. An onsite equalization pond (up to 1 acre) would be used to balance seasonal fluctuations in wastewater flowrate, thus reducing treatment equipment sizing. No wastewater would be discharged from the ponds to any surface water or offsite treatment facilities. Solids filtered or settled from the wastewater in the recycle process would be removed from the site as required, and disposed of at an approved offsite disposal facility.

2.5.3.3 Road Access and Transportation

The road access and transportation features would be the same as for the Proposed Action (see *Section 2.2.3.3, Road Access and Transportation*).

2.5.3.4 Wellfield

Ground water is proposed for use in power plant operations, including steam-cycle makeup and chilling of combustion air. Approximately 100 gallons per minute (gpm) of water (approximately 0.44 acre-feet of water per day) would be required under annual average design operating conditions. Because of seasonal fluctuations in plant operations and use of the inlet air chilling system, peak day water demand would be up to approximately 200 gpm (approximately 0.88 acre-feet of water per day). A demineralized water treatment system would be utilized to produce the ultra-pure water required by those systems.

Alternative 3 includes the development of a wellfield in the Tule Desert Hydrographic Basin (#221) to supply ground water to the power plant. Descriptions of the well field in the southern third of the Tule Desert (see Map 2-1), production well locations and the downgradient monitoring well, area of disturbance associated with each well, and system of collection pipelines, well access roads, and electrical service lines are similar to those for the Proposed Action (see *Section 2.2.3.4, Wellfield*), with the following exceptions. Under Alternative 3, it is assumed that up to three deep wells (rather than up to 15 deep wells for the Proposed Action) would be required over the life of the project and would disturb no more than 3 acres total. In addition, a manifold system would interconnect the output from each of these wells to a 4-inch-diameter buried pipeline (rather than a 24-inch-diameter buried pipeline for the Proposed Action) that would extend from the Tule Desert approximately 12 miles to the Toquop Wash plant site. The raw water storage tank used to maintain constant flow in the pipeline

Map 2-6
8-1/2 by 11 color (front)

Map 2-6
8-1/2 by 11 color (back)

Figure 2-3
8-1/2 x 11 color (front)

Figure 2-3
8-1/2 x 11 color (back)

would be similar to, but smaller in size, than the 500,000-gallon storage tank described for the Proposed Action, and would disturb no more than 1 acre. Access to this storage tank and the production wells would be the same as for the Proposed Action.

Permanent water rights that would be required to supply up to 170 acre-feet of water per year from the Tule Desert wellfield necessary to operate the Toquop Energy Project under Alternative 3 have been jointly applied for by Vidler Water Company, Inc. (a sister company of NLRC) and Lincoln County. The Nevada State Engineer has approved 2,100 acre-feet of water per year of the Vidler Water Company - Lincoln County water right applications. Toquop Energy would acquire these water rights for the 42-year life of the project at which time water rights would revert to Lincoln County.

2.5.3.5 Water Pipeline

Ground water withdrawn from the Tule Desert wellfield would be pumped and gravity-fed through a 4-inch-diameter ductile iron or steel pipeline 12.5 miles to the power plant site. Pipeline capacity would only be sufficient for the Toquop Energy Project air-cooled power plant. Other features of the water pipeline would be the same as for the Proposed Action including acres of land disturbed and reclaimed (see *Section 2.2.3.5, Water Pipeline*).

2.5.4 Construction Activities

Construction activities associated with site clearing and preparation, foundation construction, building and equipment installation, and site cleanup and facility start-up would be similar to those described for the Proposed Action (see *Section 2.2.4, Construction Activities*) with the exception of differences in the acres of land disturbed and reclaimed as described below.

An estimated 417 acres would be disturbed and/or included in construction rights-of-way under Alternative 3. This total would consist of 80 acres that would be fenced and enclose the power plant, switchyard, condensers, equalization and evaporation ponds, associated facilities, and a lay-down area; 216 acres of new disturbance for the access road; up to 3 acres for the wellfield; 1 acre for the monitoring well; 1 acre for the storage tank; 90 acres for the water pipeline; and 26 acres for staging areas (20 acres for the access road and 6 acres for the water pipeline). Disturbed lands within rights-of-way would be reclaimed as a component of Alternative 3 according to measures described in *Section 2.2.5, Best Management Practices and Standard Operating Procedures*. Long-term disturbances would total 150 acres and consist of approximately 80 acres for the fenced power plant site; 5 acres for the wellfield, monitoring well, and storage tank; and 65 acres of net new disturbance for the access road. Other lands disturbed during construction along the access road, in the pipeline right-of-way, and at staging areas (267 acres) would be reclaimed.

2.5.5 Best Management Practices and Standard Operating Procedures

Activities that are a specifically directed and an integral part of Alternative 3 would be the same as those described for the Proposed Action (see *Section 2.2.5, Best Management Practices and Standard Operating Procedures*). They would consist of: complying with the terms and conditions of all ROWs issued by the

BLM; the protection of desert tortoise habitat as described in *Appendix A*; following BMPs and SOPs listed in *Appendix B* that are associated with project construction, operation, and maintenance activities; and complying with stipulations of the *Cultural Resources Programmatic Agreement* contained in *Appendix C*.

2.5.6 Decommissioning

Decommissioning of the power plant site under Alternative 3 would be the same as described for the Proposed Action (see *Section 2.2.6, Decommissioning*).

2.6 No Action Alternative

Section 1502.14(d) of NEPA regulations requires that the alternatives analysis in an EIS include a No Action Alternative. Under the No Action Alternative for this *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project* project-related ROWs would not be created, the Caliente MFP would not be amended, none of the project-related land disposals through sale or exchange would occur, and the power plant and related facilities would not be built or operated as described for the Proposed Action, Alternative 1, Alternative 2, or Alternative 3.

If the No Action Alternative is selected for implementation, existing conditions and trends that are described for the affected environment in *Chapter 3, Affected Environment*, of this document would continue. As a result, none of the project purposes and needs that were described in *Section 1.2, Purpose and Need*, would be met.

2.7 Alternatives Considered During Scoping but Eliminated from Further Consideration

This section describes alternatives, their components, or possible ancillary improvements that were considered in developing the Proposed Action, but which were rejected from further consideration, and the reasons for their rejection.

2.7.1 Alternative Generating Technologies

Alternative fuels to natural gas were considered but eliminated from further consideration because they would not meet an important component of project purpose and need—the need to generate electrical power at competitive costs for use by consumers to ease forecasted power shortages in the western United States. Some generating technologies were eliminated from further consideration because of fuel or resource limitations. Specifically, hydroelectric was eliminated from consideration because of a lack of available surface water resources in the general project area. Furthermore, the development of a 1,100-MW hydroelectric power plant would require the construction of a large impoundment and dam that would likely result in significant environmental impacts.

The use of biomass as a fuel was eliminated from further consideration because of economic, transportation, and fuel source availability constraints. Currently, no reasonably available sources of biomass to fuel a 1,100-MW power plant exist in the general vicinity of the proposed project site.

Fuel oil was evaluated as a possible fuel for the proposed project, but was eliminated from further consideration because no fuel oil is available in the general vicinity of the project site. In addition the cost of generation for an oil-fired power plant using combined cycle technology is typically higher than the same facility burning natural gas. The cost difference results from a combination of the cost differential between the fuel oil and the natural gas as well as the cost of fuel handling and additional air emissions controls required for the fuel oil. Further, there are risks from potential spills of fuel oil during its transport and storage .

Table 2-3 presents a comparison of the air emissions, land requirements, anticipated capacity factor, and costs of generation for natural gas (using both wet and dry cooling), coal, wind, and solar.

The power plant sites for the Proposed Action, Alternatives 1 and 3, and to a lesser extent for Alternative 2, are well-suited for the delivery of natural gas via the Kern River Gas Pipeline. Using natural gas also presents some air quality and visibility benefits compared to coal and fuel oil. The use of coal as a fuel would require the construction of up to 41 miles of new rail line at a cost of $750 million or more, additional fuel, and waste handling systems including coal pile and ash handling and storage facilities. The onsite handling and storage of coal would result in fugitive dust emissions and increased noise levels. Because the use of coal would change the basic technology of the power plant design, all of the electricity would be generated through the steam cycle, thus requiring approximately three times as much water (approximately 20,000 acre-feet per year) for cooling than needed for the gas fired technology.

Various solar power technologies that use a system of photovoltaic cells or that concentrate solar energy power through the use of parabolic troughs, collector dishes, or tracking mirrors were considered. None of these solar power alternatives were found to be practical or feasible to cost-effectively and efficiently meet the project purposes and needs. Their limitations include extremely large land requirements, higher cost of generating power, lower anticipated capacity factor.

Wind generation was considered and eliminated from further consideration because of the higher cost of generation and the lower anticipated capacity factor.

2.7.2 Alternative Locations

Alternative project locations were considered but eliminated from further consideration because they would not meet the project purposes and needs described in Chapter 1 of this document. The project sites shown in Map 1-1 were selected because they present the greatest benefits to Toquop Energy and consumers through the cost-effective generation and sale of electric power to help meet local and regional demand, and to Lincoln County through increased economic benefits associated with project development. The Proposed Action location is the only potential power plant site in Lincoln County located outside of desert tortoise critical habitat, with existing access, and that is crossed by existing electric lines and a natural gas pipeline. Alternative project locations presented greater environmental impacts (proximity to Class I areas and ACECs); greater impairment of visual, biological, and ground water resources; difficulty and additional costs for fuel delivery and transmission line access; and lack of economic benefits to

TABLE 2-3
Comparison of Alternative Fuels

		Method of Generation				
		Natural Gas-Fired Generation		Alternative Generation Methods		
Issue	**Units**	**Water-Cooled Combined Cycle at Toquop**	**Air-Cooled Combined Cycle at Toquop**	**Wind Power**	**Photovoltaic**	**Coal Plant at Toquop[5]**
Air Pollutant Emissions						
NOx	Pounds per net MW-hr, annual average[1]	0.062	0.063	NA	NA	0.67
CO	Pounds per net MW-hr, annual average	0.141	0.144	NA	NA	1.43
SO2	Pounds per net MW-hr, annual average	.037	.038	NA	NA	0.95
Greenhouse Gas Emissions						
$CO_2 + CH_4 + N_2O$	Tons CO_2 equivalent per net MW-hr, annual average	0.36	0.37	NA	NA	0.98
Fuel Consumption	BTUs per net kW-hr	6,224	6,351	NA	NA	9,500[5]
Land Required	Acres per 1,000 MW	42	22	500	10,000	900
Anticipated Capacity Factor	Actual generation per theoretical max, %	96.4	96.4	20 to 35	20 to 30	75
Anticipated Capital Cost	Cost per installed kW	$709	$717	$12,002	$5,000 - 10,000	$1,246
Total Cost of Generation	Cost per kW-hr	$0.0327[4]	$0.0333[4]	$0.047 to 0.057[2]	$0.10 - $0.15[3]	$0.0480[4]

[1]Assuming use of SCR for target NOx effluent of 2.5 ppmvd @ 15% O_2.
[2]Cost of generation does not include $0.017/kW-hr tax credit for wind power.
[3]Cost of generation does not include $0.017/kW-hr tax credit for solar power.
[4]Does not include depreciation of capital equipment.
[5]Based on aggressive control targets for coal pollutant controls, and assumption of state-of-art boiler design.

communities within and near Lincoln County.

2.7.3 Alternative Access Road

An existing access road is available from I-15 to the proposed power plant site. Nearly all of the Lincoln County and all of the Clark County portions of the existing road are within the Mormon Mesa ACEC. Alternatives to upgrading that road would require a new road through the Mormon Mesa ACEC and designated critical desert tortoise habitat or upgrading a

considerably longer existing road that would impact desert bighorn sheep habitat. Both the Caliente MFP, which covers the Lincoln County portion of the existing access road, and the Las Vegas RMP, which covers the Clark County portion of the existing access road, allow the upgrade of an existing road within an ACEC, provided all resource constraints in the MFP and RMP are enforced. In addition, both the Caliente MFP and Las Vegas RMP state that the Mormon Mesa ACEC is a right-of-way avoidance area. New roads in ACECs can only be authorized in response to specific proposed actions where no feasible alternative exists. It would not be possible to construct a new access road with the same relatively direct access to I-15 and the City of Mesquite as the existing access road without impacting undisturbed lands in both the Lincoln County and Clark County portions of the Mormon Mesa ACEC. This is not allowed under the MFP or RMP where a feasible alternative exists (in this instance the existing access road). Further, any newly constructed access road that avoids the Mormon Mesa ACEC and provides access from the City of Mesquite and I-15 to the power plant sites would be substantially longer than the improved, existing access road.

These significant policy and environmental constraints make alternative access roads infeasible and were, therefore, rejected from further analysis. In addition, the construction methods, use of staging areas, proposed road width, and nature of road improvements as described in *Section 2.2.3.3, Road Access and Transportation*, are necessary in order to construct the types of facilities associated with the proposed project and to then operate the proposed project continuously over a 42-year period. Without the upgrade, the road would deteriorate to the point at which it would no longer meet the required level of service.

2.8 Preferred Alternative

BLM's Preferred Alternative is the Proposed Action which includes:

- Issue ROW for southern power plant site (Section 36)
- Issue ROW for western utility alignment
- Issue ROW for wellfield
- Issue ROW for Access Road between I-15 and southern power plant site
- *Proposed Toquop Land Disposal Amendment to the Caliente MFP*— Section 36 (southern parcel) suitable for disposal
- Toquop/Pah Rah (Washoe County) land exchange (Section 36)
- Construction and operation of a up to 1,100-MW natural gas-fired water-cooled power plant and ancillary facilities
- Comply with other requirements:
  - *Measures for Protecting Desert Tortoises and their Habitat (Appendix A)*
  - *Standard Construction and Operation Procedures (Appendix B)*
  - *Cultural Resources Programmatic Agreement (Appendix C)*